DOCUMENT RESUME

ED 173 659 CE 022 359

AUTHOR	Hagman, Joseph D.
TITLE	Typewriting: Retention and Relearning.
INSTITUTION	Army Research Inst. for the Behavioral and Social Sciences, Arlington, Va.
SPONS AGENCY	Army Training and Doctrine Command, Fort Monroe, Va.
REPORT NO	ARI-1211
PUB DATE	Jun 79
NOTE	42p.
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	*Job Skills; Military Training *Retention; Retention Studies; *Retraining; *Typewriting; Typists
IDENTIFIERS	*Army; United States

ABSTRACT

Retention and relearning of straight-copy typewriting skill among thirty-eight administrative specialists, 71L Military Occupational Speciality, were examined after the no-practice retention interval between Advanced Individual Training (AIT) graduation and unit duty. Over this interval, average typing speed decreased and errors increased. As a result, net typing proficiency fell below the minimum AIT graduation standard. After retention testing, twenty-five minutes of typing practice reinstated a significant amount of lost typing speed and net proficiency. It was concluded that brief refresher training is sufficient for administrative specialists to regain straight-copy typing skill. (Author/JH)

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ED173659

RESEARCH REPORT 1211

TYPEWRITING: RETENTION AND RELEARNING

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Office, Deputy Chief of Staff for Personnel
Department of the Army

June 1979

Army Project Number
2Q163731A770

Performance-Based
Training

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER Research Report 1211	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) TYPEWRITING: RETENTION AND RELEARNING		5. TYPE OF REPORT & PERIOD COVERED --- 6. PERFORMING ORG. REPORT NUMBER ---
7. AUTHOR(s) Joseph D. Hagman		8. CONTRACT OR GRANT NUMBER(s) ---
9. PERFORMING ORGANIZATION NAME AND ADDRESS US Army Research Institute for the Behavioral and Social Sciences, 5001 Eisenhower Avenue, Alexandria, Virginia 22333		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 2Q163731A770
11. CONTROLLING OFFICE NAME AND ADDRESS Training Developments Institute, TRADOC Fort Monroe, VA 23651		12. REPORT DATE June 1979 13. NUMBER OF PAGES 38
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office) ---		15. SECURITY CLASS. (of this report) Unclassified 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release, distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

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18. SUPPLEMENTARY NOTES

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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Typewriting
Training
Retention
Refresher Training
Relearning
Straight-copy typewriting

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Retention and relearning of straight-copy typewriting skill among 38 Administrative Specialists, 71L Military Occupational Specialty, were examined after the no-practice retention interval between Advanced Individual Training (AIT) graduation and unit duty. Over this interval, average typing speed decreased and errors increased. As a result, net typing proficiency fell below the minimum AIT graduation standard. After retention testing, 25 minutes of typing practice reinstated a significant amount of lost typing speed and net proficiency. It was

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concluded that brief refresher training is sufficient for Administrative Specialists to regain straight-copy typewriting skill.

The report is intended for military training personnel.

FOREWORD

The Training Technical Area of the Army Research Institute for the Behavioral and Social Sciences (ARI) has actively pursued a program of research in support of the systems engineering of training. A major focus of this research is to develop the fundamental data and technology necessary to field integrated systems for improving individual job performance. Such systems include Skill Qualification Testing (SQT), job performance aids, training courses in schools and in the field, performance criteria, and management and feedback systems.

This report is the first of several on specific topics in the area of skill retention; ARI Technical Paper 313 provided a review of the general area. The long-term goal is to develop a method for predicting the rate of proficiency loss for all types of skills, in response to requirements by the Deputy Chief of Staff for Training of the Army Training and Doctrine Command (TRADOC). The work was accomplished by ARI personnel under Army Project 2Q163731A770, FY 1979, "Performance-Oriented Individual Skill Development and Evaluation" for the Training Developments Institute, TRADOC, with the combined support of the Deputy Chief of Staff for Operations of the Army, Europe; the Commander, 7th Army Training Command, Europe; the Commander, 21st Replacement Battalion, Europe, and the Director of the Administration School, Fort Jackson, S.C.

JOSEPH ZEIDNER
Technical Director

TYPEWRITING: RETENTION AND RELEARNING

BRIEF

Requirement:

To evaluate loss of straight-copy typewriting skill between Advanced Individual Training (AIT) graduation and unit duty and to determine the effect of refresher training on recovery of proficiency.

Procedure:

Straight-copy typewriting performance of 38 Administrative Specialists, 71L Military Occupational Specialty (MOS), was measured three times. The first test session occurred at end-of-course testing prior to graduation from AIT. The second test session was conducted prior to the start of unit duty at the 21st Replacement Battalion in Frankfurt, Germany. After completing the second test session, all soldiers practiced straight-copy typing for 25 minutes and then performed in the third test session.

Findings:

Without practice, average typing speed dropped 12% and errors increased 96% between AIT graduation and unit duty. As a result, net typing proficiency fell below the minimum AIT graduation standard. These performance decrements occurred within 14 days of AIT graduation. No additional decrements were found as the interval between AIT graduation and unit duty was extended from 14 to 38 days. Twenty-five minutes of practice reinstated 28% of lost typing speed and 19% of lost net typing proficiency. Errors, however, were not affected significantly by practice. Based on relearning rate, it was predicted that approximately 1½ hours of practice would be needed to return net typing performance to minimum AIT graduation standards. In addition, it was predicted that the higher AIT end-of-course performance level would be regained after 2½ hours of typing practice.

Utilization of Findings:

Brief refresher training before the start of unit duty is sufficient for Administrative Specialists to regain straight-copy typing proficiency demonstrated at AIT.

TYPEWRITING: RETENTION AND RELEARNING

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TYPEWRITING: RETENTION AND RELEARNING

INTRODUCTION

Effective organizational functioning depends on the performance of clerical personnel. Many Army clerical tasks, from preparation of correspondence to computer keypunching, require proficiency in straight-copy typewriting. To insure retention of straight-copy typing skill, the Army must know the rate and magnitude of typing skill loss during periods of no practice, as well as the amount of refresher training needed to keep typing proficiency at a desirable level. This research examined retention and relearning of straight-copy typewriting by Army clerical personnel.

Several investigators have reported that straight-copy typing proficiency is retained over long time intervals of no practice, and that relearning is rapid when compared to the rate of original learning (Freeman & Abernathy, 1930; Hill, 1934, 1957; Hill, Rejall & Thorndike, 1913; Schroeder, 1934). Conclusions of these researchers must be considered tentative because (a) materials used to test retention were not equated for difficulty, (b) repeated typing of the same materials may have inflated relearning rates, and (c) the data were not analyzed statistically. Thus, Army commanders and trainers have little specific information to determine how well typing proficiency is retained and how quickly typing proficiency can be regained with refresher training. The research reported in this paper was designed to answer these questions.

OBJECTIVES

This research examined the following:

- Loss of straight-copy typewriting proficiency during the no-practice retention interval occurring between Advanced Individual Training (AIT) graduation and the start of unit duty.
- The effect of 25 minutes of practice on recovery of typewriting proficiency lost between AIT and unit duty.

PROCEDURES

Straight-copy typewriting performance of Administrative Specialists, 71L Military Occupational Specialty (MOS), was tested at three separate sessions. Figure 1 shows test design. The first test session occurred at end-of-course testing prior to AIT graduation. The second test session occurred prior to the start of unit duty at the

21st Replacement Battalion in Frankfurt, Germany. The third test session took place 30 minutes after completion of the second test session. Soldiers used this 30-minute interval to practice straight-copy typing (25 minutes) and to rest (5 minutes).

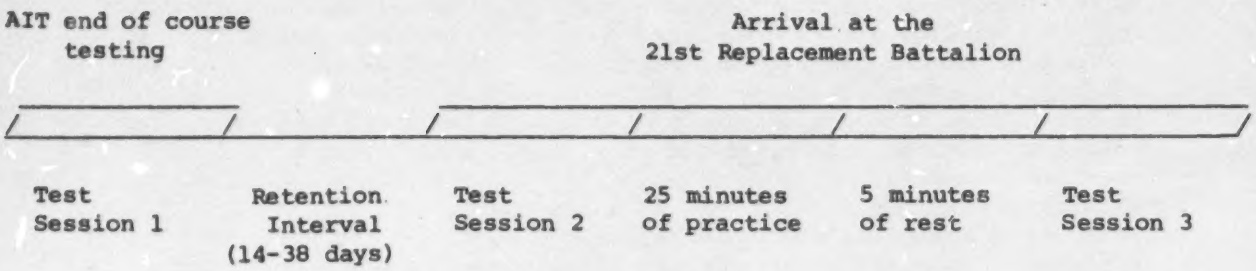
AIT end of course testing
Arrival at the 21st Replacement Battalion
Test Session 1
Retention Interval (14-38 days)
Test Session 2
25 minutes of practice
5 minutes of rest
Test Session 3

Figure 1. Order of Testing

Before the second test session, soldiers completed a short questionnaire in which they reported the length of time between AIT graduation and arrival for unit duty and the amount of typing performed during this interval.

RESULTS

Scoring methods used by the Administration School were adopted to evaluate typing performance at all test sessions. Typing was evaluated for speed [gross words per minute (gwpm)], accuracy (errors), and a combined weighting of speed and accuracy [net words per minute (nwpm)]. The best nwpm score, with corresponding gwpm and errors scores, for each soldier was subjected to statistical analyses. Eighty-four percent (38) of the 45 soldiers questioned had not typed since AIT graduation, and only their typewriting performances were analyzed.

Retention

Average typing performance scores related to the AIT-unit duty retention interval are shown on the left side of Figure 2. The time between AIT and unit duty ranged from 14 to 38 days for individual soldiers, with a group average of 25 days. The average nwpm typed by soldiers at AIT end-of-course testing was 28.3. This is 3.3 nwpm above the minimum standard for course completion and supports previous findings (Fink, Behringer, Wagner, & Showel, 1974). Nwpm decreased 27%

between AIT and unit duty and fell below the 25 nwpm AIT graduation standard. Gwpm decreased 12% and errors increased 86% over this period. Thus, the decrease in nwpm occurring between AIT graduation and the start of unit duty was caused by a reduction in both speed and accuracy of straight-copy typing performance.

During the first 14 days of no practice following AIT graduation, typing performance deteriorated, but did not continue to decrease significantly with longer periods of no practice. As shown in Figure 3, no performance measure varied systematically over the 14- to 38-day retention interval.

All typing performance decrements were interpreted as being caused by the forgetting of typing skill over the no-practice period between AIT graduation and arrival at the 21st Replacement Battalion. The Technical Supplement discounts other explanations of the data based upon the concepts of motivation and fatigue.

Relearning

Average typing scores following the short practice session are shown on the right side of Figure 2. When compared to the usual 5- to 7-week duration of AIT, relearning was rapid. Reinstatement of 28% of lost gwpm and 19% of lost nwpm occurred over the 25-minute practice period. These percentages translate into a relearning rate of 1 gwpm and 1½ nwpm per 25 minutes of typing practice. Error rate, however, did not change significantly. As a result, the beneficial effect of practice on nwpm was caused primarily by recovery of typing speed. On the basis of the relearning rate for nwpm, it is predicted that (a) soldiers will return to the minimum AIT graduation standard of 25 nwpm with approximately 1½ hours of typing practice, and (b) soldiers will recover their original AIT performance level after approximately 2½ hours of practice.

CONCLUSIONS

Prior to assuming unit duty, the straight-copy typing performance of Administrative Specialists was below the minimum AIT graduation standard. This drop in performance occurred within a 14-day, no-practice retention interval following AIT graduation. No additional performance decrements were found when this no-practice interval was extended from 14 to 38 days. A significant amount of lost typing proficiency was regained after 25 minutes of straight-copy practice. Thus, brief refresher training before the start of unit duty is sufficient for Administrative Specialists to regain straight-copy typing proficiency.

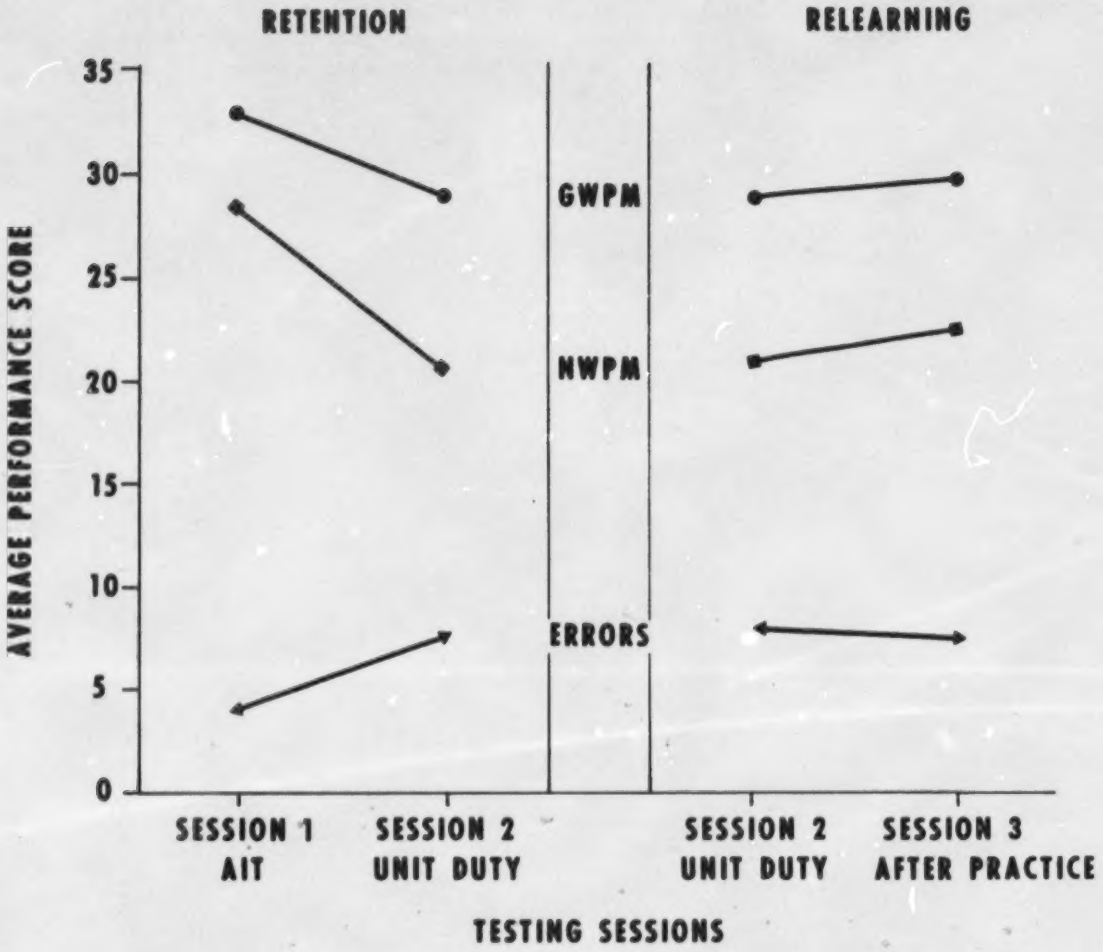

Figure 2. Average typing performance scores obtained at each testing session. Sessions 1 and 2 were separated by an average of 25 days; Sessions 2 and 3 were separated by 25 minutes of typing practice.

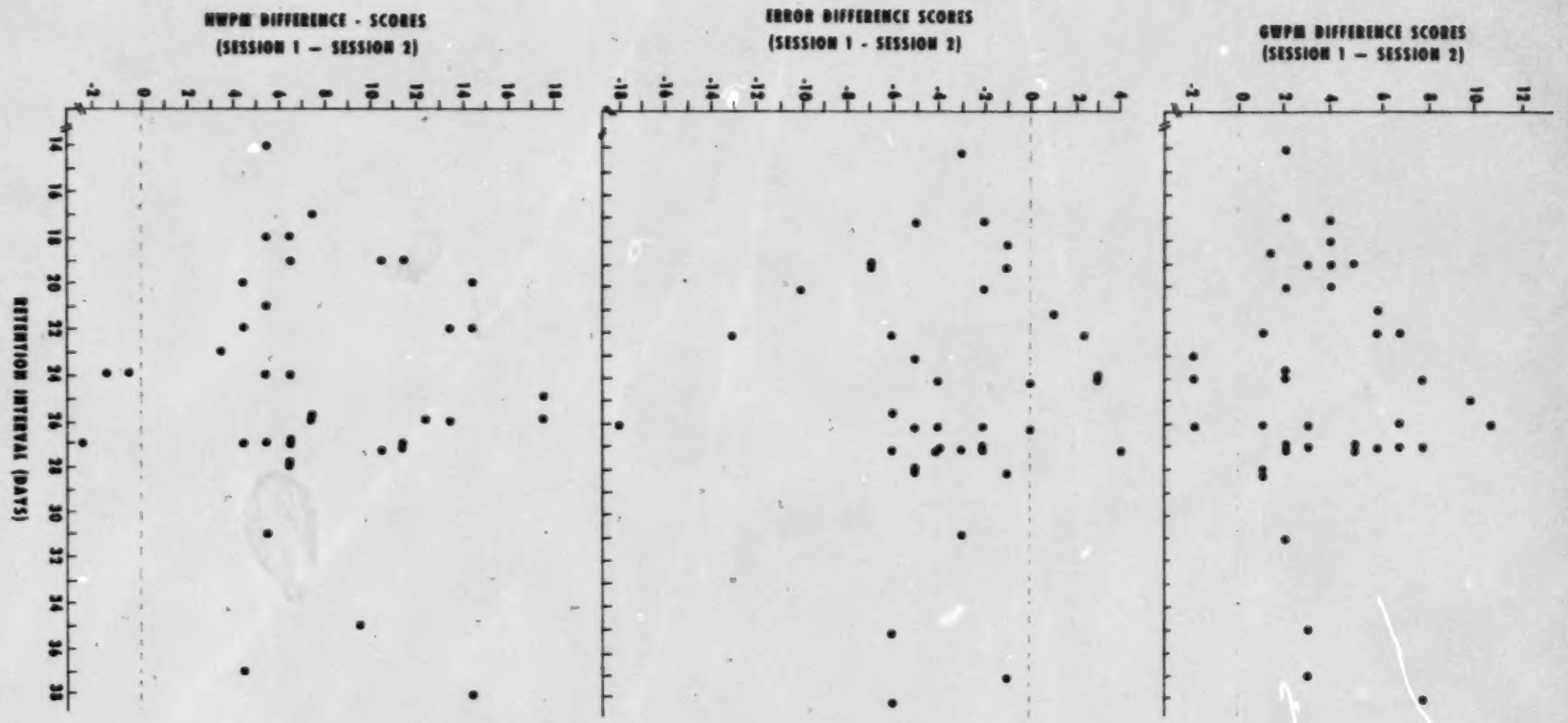
NWPM DIFFERENCE - SCORES
(SESSION 1 – SESSION 2)
ERROR DIFFERENCE SCORES
(SESSION 1 - SESSION 2)
GWPM DIFFERENCE SCORES
(SESSION 1 – SESSION 2)
RETENTION INTERVAL (DAYS)

Figure 3. Differences in gwpm, errors, and nwpm between Sessions 1 and 2 as a function of retention interval length.

TYPEWRITING: RETENTION AND RELEARNING

Retention of typewriting proficiency acquired during AIT was measured after the no-practice retention interval between AIT graduation and the start of unit duty. After retention testing, the relearning of typewriting skill was examined. Performance was measured in terms of gwpm (speed), errors (accuracy), and nwpm (a combination of speed and accuracy). The following sections describe the research methodology and statistical analyses.

METHOD

Subjects

Thirty-eight Administrative Specialists, 71L MOS, who graduated from AIT at Fort Jackson, S.C., in September and October 1978 participated in the research project. They were assigned to the U.S. Army Europe (USAREUR) and were routed through the 21st Replacement Battalion, Frankfurt, Germany.

Procedure

Testing was done at three separate sessions. The first session occurred at end-of-course testing conducted by Administration School personnel prior to AIT graduation. These scores were used as the baseline against which subsequent typing performance was compared. The second and third sessions were conducted by Army Research Institute (ARI) personnel at the 21st Replacement Battalion. The time interval between Sessions 1 and 2 ranged from 14 to 38 days for individual soldiers, with a group average of 25 days. Immediately after Session 2, all soldiers typed for 25 minutes on preselected practice exercises, rested for 5 minutes, and then typed in Session 3.

A 5-minute warmup typing exercise preceded Sessions 2 and 3; a 10-minute warmup exercise preceded Session 1. The warmup exercises allowed soldiers to become accustomed to their typewriters and to determine if the machines were functioning properly. The warmup period also helped to reinstate temporal and postural adjustments required for typing.

Typing performance was scored in terms of speed and accuracy. Typing speed was determined by using the formula for gwpm (Appendix A). Errors were scored when words were misspelled; when words and punctuation marks were omitted or incorrectly inserted; when the spacing between lines was different from the test copy; and when a letter was struck over, erased, or X-ed over (Appendix B). Only the performance on test materials was scored.

Testing was conducted individually and in groups, depending on the number of soldiers available. Test instructions (Appendix C) stressed both speed and accuracy. A countdown procedure began each test, and the stop signal was a loud, sharp, "stop." The interval between tests at each session was approximately 5 minutes. Researchers used stopwatches to measure all intervals.

Test Materials

Two sets of test materials were used. One set of tests was prepared by the U.S. Army Adjutant General School at Fort Benjamin Harrison, Ind. It included a warmup typing exercise and two tests (Appendix D). One test was labeled CC, and the other test was labeled DD. The second test was developed at ARI, Alexandria, Va.; the two tests in this set were labeled AA and BB (Appendix E). A sufficient amount of test material was prepared to avoid repetition of any part of a test during the sessions. This was done to prevent possible practice effects caused by starting again at the beginning of the test copy before the test interval had elapsed (West, 1969, p. 527).

Because of the relationship between test difficulty and typing speed (Robinson, 1967), the difficulty level of the four tests was equated. Difficulty level was defined in terms of stroke intensity (average number of typewriter strokes per dictionary word, including interword space) and syllabic intensity (average number of speech syllables per dictionary word). Table 1 shows the specific values for difficulty level of written business communication (West, 1969). With tests equated for difficulty, differences in typing test performance can be attributed to variables of interest, i.e., retention and relearning.

Table 1

Stroke Intensity and Syllabic Intensity for Typewriting Tests

Test	Stroke intensity	Syllabic intensity
CC	5.95	1.67
DD	6.19	1.68
AA	6.10	1.65
BB	6.18	1.63

Typewriters

Soldiers used manual typewriters at all test sessions. The typewriters were identical to those used at AIT in make and model (Olivetti Model Linea 98 and Remington Model 94). The typewriters were preset for double spacing and a 1-inch left margin. Since typing was word-for-word and line-for-line, the right margin was set off the paper and was not used. The tabulator was set for a 5-space paragraph indentation.

Questionnaire

Soldiers completed a questionnaire (Appendix F) before participating in Session 2 that provided information on the length of the AIT-unit duty retention interval for each soldier and the amount of typing each soldier performed during this time. Only data from soldiers who did not type between AIT and unit duty were analyzed.

Design

A 2 x 3 mixed-treatment factorial design was used. The within-subject variable was sessions, and the between-subject variable was order of test materials. In this design, all soldiers participated in each of the three test sessions. Half were tested under Order 1 and the other half under Order 2. Table 2 depicts the specific test materials administered under the two orders for each testing session.

Table 2*

Order of Test Materials Used Across Testing Sessions

Order	Testing session		
	Session 1	Session 2	Session 3
1	CC/DD	AA/BB	CC/DD
2	CC/DD	CC/DD	AA/BB

RESULTS AND DISCUSSION

The dependent variables of gwpm, errors, and nwpm were calculated for individual soldiers within each of the six experimental conditions. These six conditions were formed originally by the factorial combination of three test sessions and two presentation orders of materials. Based

upon scoring methods used by the Administration School at Session 1, each soldier's best nwpm score and associated gwpm and error scores were selected from the two tests taken at each session.[1] Analyses of variance were performed on these scores. Typewriting performance was analyzed only for the 84 percent (38) of the soldiers questioned who had not typed since AIT graduation.

Retention

Both gwpm and nwpm decreased and errors increased between AIT and unit duty. This conclusion is supported by a significant main effect of sessions for nwpm, $F(2, 72) = 55.07$; gwpm, $F(2, 72) = 31.29$; and errors, $F(2, 72) = 15.02$; with $p \leq .05$ in all cases. Based upon this significant main effect, individual comparisons were performed using the least squared difference (LSD) test (Carmer & Swanson, 1973). The rejection region for all individual comparisons was .05. Significant decreases in nwpm, LSD(72) = 7.63, and gwpm, LSD(72) = 3.82, occurred during the retention interval, whereas significant increases in error, LSD(72) = 3.58, occurred during this same period. Thus, the decrease in nwpm occurring between AIT graduation and the start of unit duty was caused by reduction in both typing speed and accuracy.

Correlations were calculated between Session 1 and Session 2 difference scores for each dependent variable and the retention interval length associated with each soldier. All correlations were nonsignificant, $p > .05$. These statistical results, plus visual inspection of the plotted data shown in Figure 3, support the conclusion that typing performance was unrelated to the length of the retention intervals for which data were collected in the present research project. It appears that all retention losses occurred during the first 2 weeks of no practice, as suggested by Freeman and Abernathy (1930), and that no systematic performance changes were associated with added increases in the AIT-unit duty retention interval.

To examine the reliability of the data, test-retest and alternate-form reliability coefficients were calculated for test scores obtained at Sessions 1 and 2. All reliability coefficients were significant, as shown in Table 3, and were similar to those reported previously by West (1969, p. 296). Thus, test scores were not susceptible to random variations in the conditions of soldiers or in the testing environment that occurred between test Sessions 1 and 2.

---

[1] Although students at AIT were tested on 2 separate days, only the best scores from the two tests taken on the first day were used in the data analysis.

Table 3

Reliability Coefficients for Session 1 and Session 2 Test Performance

Type of reliability	Score	Coefficients
Test-retest	gwpm	.84*
	errors	.63*
	nwpm	.64*
Alternate-form	gwpm	.88*
	errors	.54*
	nwpm	.72*

*$p \leq .05$.

Differences in fatigue might explain the performance losses occurring between Sessions 1 and 2. Soldiers at the 21st Replacement Battalion may have been too tired to perform at their optimal level because of fatigue caused by overseas travel. To examine this possibility, scores from the 25 soldiers tested at the 21st Replacement Battalion after a night's sleep were compared with the scores of the 13 soldiers who were tested on the day of their arrival. This comparison revealed no significant difference between groups on typing speed or accuracy, $p > .05$. If fatigue were affecting all soldiers, one might expect scores at Session 3 to be lower than those at Session 2 because of the occurrence of a fatiguing 25-minute typing period between these two sessions. This was not the case (analyses are reported below).

It might also be suggested that a higher motivational level at AIT end-of-course testing than at the 21st Replacement Battalion may have caused the obtained differences in typing performance. Although few researchers would deny the relationship between motivation and performance, the specific form of this relationship is important to consider before suggesting motivation as a casual variable. As stated in the Yerkes-Dodson Law (Yerkes & Dodson, 1908), the relationship between motivation and performance is not monotonic. Therefore, performance under high motivation (possibly experienced at AIT) may not be superior to performance under low motivation (possibly experienced at the 21st Replacement Battalion). In fact, the possibility of performance actually being better at low rather than high motivational levels increases for difficult tasks such as typewriting. Therefore, until more is known about (a) the level of motivation of soldiers at different testing locations, and (b) the exact relationship between motivation level and typewriting performance, it is better not to rely

upon motivation as a casual variable in this research. Thus, the most appropriate explanation is that decrements in typing performance were caused by retention losses resulting from lack of typing practice between Sessions 1 and 2.

Relearning

Practice time between Session 2 and Session 3 increased both gwpm and nwpm. A significant increase was found for nwpm, LSD(72) = 1.49, and gwpm, LSD(72) = 1.08, whereas errors remained statistically unchanged. Thus, the beneficial effect of practice on nwpm can be attributed primarily to a recovery of typing speed.

The slopes of the functions relating practice and performance were calculated. These slopes were used to predict the amount of practice needed for soldiers to regain lost typing proficiency. With a slope of 1.08 for gwpm, it was predicted that soldiers will need approximately 2 hours of straight-copy practice to regain typing speed demonstrated at AIT end-of-course testing. The slope of 1.45 for nwpm supports two predictions. First, soldiers will need approximately 1½ hours of practice to return to the minimum typing standard of 25 nwpm required for AIT graduation. Second, soldiers will regain the actual nwpm levels recorded at AIT end-of-course testing after approximately 2½ hours of typing practice.

These predictions must be considered approximate for two reasons. First, they are based on a linear relearning model that may not be completely accurate. Second, they do not take into account any relearning that may have resulted from Session 2 testing.

Materials

Materials used at each testing session were found to be of equal difficulty. This was indicated by the lack of either a main effect of Order, or an Order x Session interaction for all three dependent variables. Thus, changes in typing performance across sessions were not caused by changes in the difficulty of test materials.

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APPENDIX A

FORMULAS FOR GWPM AND NWPM

Scoring Formulas

$$GWPM = \frac{\text{Total Number of Typing Strokes}/5}{\text{Number of Minutes in Test}}$$

NWPM = GWPM - ERRORS

APPENDIX B

RULES FOR SCORING ERRORS

Rules for Determining Errors

A. Only one error will be charged to each word regardless of how many actual errors are made in the word. The following list describes the kinds of errors which will be counted:

1. A misspelling will be an error.

2. An omission will be an error. The omission of an entire line or more, or part of a sentence (two or more words), will also be an error.

3. A substitution or insertion will be an error.

4. A punctuation mark omitted or incorrectly copied will be an error unless it follows a word in which an error has been made.

5. If only part of a capital letter is typed, count one error; however, if the whole letter is visible as a unit, even though not properly in the line, no error is counted.

6. Any variation from the capitalization in the text of the test will be an error.

7. A strikeover will be an error.

8. An erasure will be an error.

9. An X-ed out word or word fragment will be an error.

10. A transposition will be an error.

11. If a fragment (any length) is typed twice, count the entire repeated fragment as only one error. In addition, count any errors made within the repeated fragment as one error. Words in the repeated fragment will not be counted in the word count.

12. Each failure to return the carriage to the left margin for the start of the next line will be an error unless due to equipment malfunction.

13. Each failure to double space between lines will be counted as an error. Single spacing and triple spacing between lines will be counted as errors. Only one error per line will be charged for this type of error.

14. Each paragraph which is not indented five spaces will be counted as an error unless due to equipment malfunction.

B. Types of questionable performance not counted as errors.

1. A faint impression, due to striking a key too lightly, is not an error if the entire letter is visible.

2. Failure to type word for word and line for line will not result in any error.

3. Any error which occurs in a last incomplete word will be ignored.

4. Incorrect spacing will not be counted as an error because of typewriter malfunctions.

APPENDIX C

INSTRUCTIONS

*Have each participant complete the questionnaire before starting test session 2 (T2).

Purpose: The present study is designed to examine two aspects of straight-copy typewriting performance:

1. The forgetting of straight-copy typing performance that occurs between AIT graduation and the start of unit duty.

2. The relative permanence of the demonstrated forgetting, i.e., how much practice is needed to regain lost typing proficiency.

General Procedure: The general procedure we will be following throughout the session will consist of three phases:

Phase 1. Two 5-minute straight-copy typing tests preceded by a 5-minute warmup exercise.

Phase 2. 25 minutes of straight-copy typing practice plus a 5-minute rest period.

Phase 3. Two 5-minute straight-copy typing tests preceded by a 5-minute warmup exercise.

Typewriters: Your typewriters have been prepared in advance such that

1. The tab is set for a 5-space indentation,

2. The carriage throw is set for double spacing,

3. The right margin is set off the paper to the right because it will not be needed,

4. The left margin is set at 10 spaces.

PHASE 1 INSTRUCTIONS

The test materials that you will be using during the session are contained in the booklet that I will now distribute. Before opening the booklet, please listen to the following description of the contents of the Phase 1 section and the procedure that you will be asked to follow while typing from it.

Contents:

1. Warmup exercise.

2. Two consecutive typing tests labeled AA and BB or CC and DD depending upon the form of the test booklet that you received.

Procedure:

First you will be asked to type 5 minutes on the warmup exercise. Then, you will type the two tests with each test being 5 minutes in length.

To Begin

Please insert two pieces of paper. Drop down the paper and prepare to start typing the warmup exercise. Once I have given you the start command, continue to type word for word and line for line until I give you the command to stop. At that time, stop typing and wait for further instructions. Do not turn the test booklet page to the tests until instructed. The warmup exercise will not be scored, but is merely intended to be a time for you to become accustomed to the typewriter.

Are there any questions?

If not, turn to the warmup exercise. When I say go, begin typing as fast and as accurately as you can. Do not forget to type word for word and line for line.

Ready/Set/Go

5 minutes of typing

Stop

Before turning to the first test on the next page of your test booklet, please remove your paper and place the warmup sheet face down on the left side of your typewriter. Then, insert another sheet of paper together with your original backing sheet and drop down the paper and prepare to type test CC or AA (depending upon the form that you have received).

While typing the test, capitalize, punctuate, and paragraph exactly as shown in the test booklet copy. Do all typing line for line by throwing the carriage upon completing each line of the test copy. You will receive 5 minutes to type. If you complete the first page, insert a new sheet of paper and go on to the second page of the test. If you complete both pages of the test before the 5-minute time period has elapsed, simply insert another sheet of paper and start typing from the beginning of the first page of the test. Continue typing until you are told to stop. Because your score on the test will be judged on both speed and accuracy,

type as fast and as accurately as possible. If errors are made, continue to type without correcting them. If you realize that you have repeated part of a line, stop typing on that line and begin typing on the next correct line.

Are there any questions?

Ready/Set/Go

5 minutes of typing

Stop

Please remove your typed test sheet from the typewriter and place it face down on top of the warmup sheet. Insert a new sheet of paper along with your original backing sheet. The same instructions and procedure used for the previous test will apply to the next test. On the new sheet of paper drop down and prepare to type when I give you the signal. Now turn to test DD or BB (depending upon the form you have).

Are there any questions?

Ready/Set/Go

5 minutes of typing

Stop

Please remove the typed test sheet and place it face down on top of the previous test sheet. Insert a new sheet of paper and drop down and prepare to type the practice exercises of Phase 2.

PHASE 2 INSTRUCTIONS

Phase 2 will last a total of 25 minutes and will consist of practice typing from the 8 exercises contained in your test booklet, e.g., #1 is "The Problem of Accidents." During the next 25 minutes I would like you all to start typing with #1 and go as far as you can until I say stop. If you complete all 8 exercises before the stop signal, simply begin typing again on exercise #1. Type word for word and line for line as on the previous materials. You will be on your own during the session, so you will have to insert your own paper when necessary. When doing so, please stack it face down in the previously established pile. Your performance in these practice exercises will not be scored, however, please continue to type from them for the entire 25-minute period. As before, do not correct errors but simply continue typing.

Are there any questions?

Ready/Set/Go

25 minutes of typing

Stop

You may now rest for 5 minutes before starting Phase 3 of the test session.

PHASE 3 INSTRUCTIONS

Phase 3 instructions were identical to those read for Phase 1.

APPENDIX D

TYPING TESTS CC AND DD PLUS WARMUP EXERCISE

Warm-up Exercise

The postal number that we type so neatly on labels and envelopes emerged from the Zoning Improvement Plan that the Post Office started in the spring of 1963 as a way to speed delivery of the mail. The five figures in the number are a special code that lets mail be sorted much more quickly and accurately. The plan caught on at once, and business firms throughout the nation put the codes on their mailing lists.

There are two phases, one concerned with bulk mail and another that has to do with individual cards and envelopes. Although typists are involved only in the second kind, they should know that ZIP numbers do not apply to letters alone.

The bulk mail, like magazines and circulars, has to be placed in bags, one for each local postal zone to which the mail is to go. The mailers like the plan for, once they adjust their mailing lists, it is easy to bag what they are mailing, and the bags start on their way without any delay.

Handling a single card or envelope is different. Such pieces must be sorted in the Post Office. If cards and envelopes have the full postal zone number in precisely the right place, the sorting can be done ten times as fast by a scanning machine as it ever could be by human eye and hand.

What is the proper place? It is after the state name, preceded by some blank space. How much space? The scanner requires not less than a sixth nor more than a half inch of space. The postal department stresses that the code be not less than two nor more than six spaces away from the state.

INSERT NEW PAPER AND BEGIN TYPING WITH THE WORDS, "The postal number...."

Typing Test CC

Military leadership is the art of influencing and directing men in such a way as to obtain their confidence, respect, and loyal cooperation in order to fulfill the mission. A leader is a person who influences and directs others.

An officer maintains close personal contact with only a few individuals. He must depend upon these individuals to make his will known and to carry out his purposes. The success of a unit depends upon the leader's capacity to promote desirable relationships between himself, the unit, and the individual members of the unit. Such conditions will result in highly motivated individuals, working as a team, with mutual confidence and respect.

A leader must know that his own character has an important influence on his subordinates. If he demonstrates high moral principles and integrity, these qualities will influence other people. A person who has matured in our society usually has acquired spiritual and moral values which not only strengthen the individual's character but also provide him with a source of inner strength and stability during times of crisis. Man's need to live up to the accepted spiritual and moral code of his society will help him to overcome fear. It will help provide courage to face difficult issues in his daily life or to fight well in combat.

INSERT NEW PAPER AND BEGIN TYPING THE NEXT PAGE.

The leader's religious life, which serves as a bulkwark in his own life when he is confronted with difficult challenges, is a vitally important factor in producing stable qualities in other men. If he thoroughly understands and exhibits moral and spiritual values, he will be prepared to lead his own men even in this nuclear era in which men will have to face the danger of tremendous destructive forces.

A good leader, by control of his voice and gestures, can have a firm and steadying influence over those around him, especially in combat. Few things can steady the morale of troops more than the realization that their leader, with full knowledge of the difficulties of a situation, neither looks nor acts worried as perhaps he has a right to do.

Knowledge of other men's behavior and of the reasons for this behavior is necessary for leadership. For example, certain conditions must be met if an individual's pattern of behavior is to be socially acceptable and satisfying to himself. These conditions, or roots of behavior, may be called basic human needs. The desire for group approval is one of the strongest urges of man. He will put forth great effort to win this approval.

INSERT NEW PAPER AND BEGIN TYPING WITH THE WORDS, "Military leadership...."

Before a selection of training activities can be made, a decision must be reached as to the immediate mission of a particular unit. Needs differ with the type of troops involved, their age, their physical condition, stage of training, and other local factors. The administration of a suitable program of training is not dependent upon elaborate facilities. Many of the activities require no special apparatus or facilities. However, the availability of equipment will have some effect upon the planning of the program.

The terrain and the type of climate of an area govern the selection of the courses for the training program. In regions where changes of climate are frequent, inclement weather schedules have to be planned. The availability of suitable local terrain for the various courses and games always has to be considered in working out a training program and schedule.

The training program, to be adequate, must insure the conditioning of all personnel. Improvement of muscle tone, strength, and muscular endurance is essential. The program should be well balanced and should provide opportunity for conditioning, variety, recreation, and the development of skills in addition to fostering desirable individual and team traits.

Conditioning drills, grass drills, and guerrilla tactics should be included in the program, but to a limited extent.

INSERT NEW PAPER AND BEGIN TYPING THE NEXT PAGE.

These activities provide a warmup for the sports and games and, in addition, reach muscle groups which may not be used in the athletic programs.

The athletic activities used should be of the most vigorous type. Such sports as soccer, basketball, and other similar games are recommended. Games such as softball and volleyball should not be used during the toughening and slow-improvement stages of the physical training program because they are not sufficiently strenuous. Football is an excellent game for well-conditioned men, but does not lend itself to use during the on-duty program because it requires a large amount of equipment.

The foot march may be used as part of physical conditioning. Obviously, foot care is essential to foot marching. The foot is deisgned to cushion the body against the shock of walking. The heel and ball of the foot and the ankle have little padding. The foot's blood vessels are close to the surface and are easily compressed by tight socks or shoes.

Prevention of foot trouble is the best first aid for feet. The Soldier can prevent many minor foot ailments by personal care. Blisters are caused by friction. Therefore, if the cause can be controlled, the blister may be prevented.

INSERT NEW PAPER AND BEGIN TYPING WITH THE WORDS, "Before a selection...."

APPENDIX E

TYPING TESTS AA AND BB PLUS WARMUP EXERCISE

Warm-up Exercise

The postal number that we type so neatly on labels and envelopes emerged from the Zoning Improvement Plan that the Post Office started in the spring of 1963 as a way to speed delivery of the mail. The five figures in the number are a special code that lets mail be sorted much more quickly and accurately. The plan caught on at once, and business firms throughout the nation put the codes on their mailing lists.

There are two phases, one concerned with bulk mail and another that has to do with individual cards and envelopes. Although typists are involved only in the second kind, they should know that ZIP numbers do not apply to letters alone.

The bulk mail, like magazines and circulars, has to be placed in bags, one for each local postal zone to which the mail is to go. The mailers like the plan for, once they adjust their mailing lists, it is easy to bag what they are mailing, and the bags start on their way without any delay.

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What is the proper place? It is after the state name, preceded by some blank space. How much space? The scanner requires not less than a sixth nor more than a half inch of space. The postal department stresses that the code be not less than two nor more than six spaces away from the state.

INSERT NEW PAPER AND BEGIN TYPING WITH THE WORDS, "The postal number....."

Typing Test AA

The research dealing with decline in mental abilities as a result of aging has often produced contradictory results. Thus, in some studies, definite and pronounced declines are found, whereas in other studies these declines, if any, are slight. When the results of many studies are combined, they show a gradual decline in ability. However, what this average decline represents is really a mixture of two populations--the elderly who are relatively stable in their abilities and those who decline abruptly and seriously in their abilities.

Although a lot of research has been done on intelligence, a number of methodological problems are come across by some who are concerned with the relationship of mental ability and age. What should be used as the criterion of mental ability? Typically, some form of intelligence test is used, and the performance of groups of old persons is compared with groups of younger persons. This procedure has several problems with it. Intelligence tests were not designed to be used with old persons; in most cases, they were designed and tested with young subjects. There are other measurement problems. Jones has discussed some of the other considerations involved in testing mental measurements of older persons.

INSERT NEW PAPER AND BEGIN TYPING THE NEXT PAGE.

Often, tests used to measure overall mental ability will contain subtests that stress different abilities. Thus, in some cases, verbal ability may be critical, whereas on other subtests, speed of performance may be important. Often, the result of the test is given as one score, which combines the various subtests. We have already pointed out that a decline in speed of performance is found in older persons, and there is considerable evidence to indicate that there is a constant decline in performance in these types of subtests as a function of age. However, evidence for deline on verbal tests is much less clear; some studies show even a rise in performance with age.

BEGIN TYPING WITH THE WORDS, "The research dealing with....."

Typing Test BB

Experiments concerned with hearing loss induced by noise present the researcher with some problems. Records of industry can be examined to determine the approximate exposure to sound of persons who have since discovered that they have a hearing loss. This serves as a rough guide of the effect of some particular sound level on hearing loss. However, such factors as the frequency or frequencies of the sound, distance from the source, age of the worker, and a number of independent variables may have contributed to the observed hearing loss. The controlled laboratory experiment will reveal which variables are most suspect, but nothing can duplicate the exposure the worker might have received. The advantage of laboratory results is the certainty of the results; specific anteeedent sound levels can be related to observed hearing losses. With this certainty comes the problem of induced hearing loss itself. No experimenter would approach the situation with the intention of damaging someones hearing. Human subjects might be exposed to noise and the effects observed, but ethics require that the experiment be stopped if a decrement is observed. As a result, there is no certainty that higher noise levels would continue to damage hearing; perhaps the noise had already done the greatest amount of damage possible.

INSERT NEW PAPER AND BEGIN TYPING THE NEXT PAGE.

Typing Test BB (continued

To ascertain the limits of noninjurious exposure to intense sounds, animals are often used. There is no direct generalization from the animal studies to humans, but there are not major changes between induced hearing loss in animals with specific noise conditions and those observed in men exposed, without intent to induce a hearing loss, to the same sound.

Regardless of the difficulties encountered in research in the area of noise-induced hearing loss, there is little question that it does take place. At one time the concern was primarily with industrial noise and noise in certain other occupations, but more recently, with the hard-rock groups, it appears that there may be a whole generation with noise-induced hearing loss.

BEGIN TYPING WITH THE WORDS, "Experiments concerned with....."

APPENDIX F

Typing QUESTIONNAIRE

1. Name _____

2. Rank _____

3. Social Security Number _____

4. MOS _____

5. Today's Date Month _____ Day_____Year_____

6. Date of AIT Graduation Month_____Day_____Year_____

7. Location of AIT _____

8. Have you performed any typing since AIT graduation?
(circle one) Yes No
If yes, how much? _____ hours

ARI Distribution List

4 OASD (M&RA)
2 HQDA (DAMI-CSZ)
1 HQDA (DAPE-PBR)
1 HQDA (DAMA-AR)
1 HQDA (DAPE-HRE-PO)
1 HQDA (SGRD-ID)
1 HQDA (DAMI-DOT-C)
1 HQDA (DAPC-PMZ-A)
1 HQDA (DACH-PPZ-A)
1 HQDA (DAPE-HRE)
1 HQDA (DAPE-MPO-C)
1 HQDA (DAPE-DW)
1 HQDA (DAPE-HRL)
1 HQDA (DAPE-CPS)
1 HQDA (DAFD-MFA)
1 HQDA (DARD-ARS-P)
1 HQDA (DAPC-PAS-A)
1 HQDA (DUSA-OR)
1 HQDA (DAMO-RQR)
1 HQDA (DASG)
1 HQDA (DA10-PI)
1 Chief, Consult Div (DA-OTSG), Adelphi, MD
1 Mil Asst, Hum Res, OODR&E, OAD (E&LS)
1 HQ USARAL, APO Seattle, ATTN: ARAGP-R
1 HQ First Army, ATTN: AFKA-OI-TI
2 HQ Fifth Army, Ft Sam Houston
1 Dir, Army Stf Studies Ofc, ATTN: OAVCSA (DSP)
1 Ofc Chief of Stf, Studies Ofc
1 DCSPER, ATTN: CPS/OCP
1 The Army Lib, Pentagon, ATTN: RSB Chief
1 The Army Lib, Pentagon, ATTN: ANRAL
1 Ofc, Asst Sect of the Army (R&D)
1 Tech Support Ofc, OJCS
1 USASA, Arlington, ATTN: IARD-T
1 USA Rsch Ofc, Durham, ATTN: Life Sciences Dir
2 USARIEM, Natick, ATTN: SGRD-UE-CA
1 USATTC, Ft Clayton, ATTN: STETC-MO-A
1 USAIMA, Ft Bragg, ATTN: ATSU-CTD-OM
1 USAIMA, Ft Bragg, ATTN: Marquat Lib
1 US WAC Ctr & Sch, Ft McClellan, ATTN: Lib
1 US WAC Ctr & Sch, Ft McClellan, ATTN: Tng Dir
1 USA Quartermaster Sch, Ft Lee, ATTN: ATSM-TE
1 Intelligence Material Dev Ofc, EWL, Ft Holabird
1 USA SE Signal Sch, Ft Gordon, ATTN: ATSO-EA
1 USA Chaplain Ctr & Sch, Ft Hamilton, ATTN: ATSC-TE-RD
1 USATSCH, Ft Eustis, ATTN: Educ Advisor
1 USA War College, Carlisle Barracks, ATTN: Lib
2 WRAIR, Neuropsychiatry Div
1 DLI, SDA, Monterey
1 USA Concept Anal Agcy, Bethesda, ATTN: MOCA-MR
1 USA Concept Anal Agcy, Bethesda, ATTN: MOCA-JF
1 USA Arctic Test Ctr, APO Seattle, ATTN: STEAC-PL-MI
1 USA Arctic Test Ctr, APO Seattle, ATTN: AMSTE-PL-TS
1 USA Armament Cmd, Redstone Arsenal, ATTN: ATSK-TEM
1 USA Armament Cmd, Rock Island, ATTN: AMSAR-TDC
1 FAA-NAFEC, Atlantic City, ATTN: Library
1 FAA-NAFEC, Atlantic City, ATTN: Human Engr Br
1 FAA Aeronautical Ctr, Oklahoma City, ATTN: AAC-44D
2 USA Fld Arty Sch, Ft Sill, ATTN: Library
1 USA Armor Sch, Ft Knox, ATTN: Library
1 USA Armor Sch, Ft Knox, ATTN: ATSB-DI-E
1 USA Armor Sch, Ft Knox, ATTN: ATSB-DT-TP
1 USA Armor Sch, Ft Knox, ATTN: ATSB-CD-AD
2 HQUSACDEC, Ft Ord, ATTN: Library
1 HQUSACDEC, Ft Ord, ATTN: ATEC-EX-E - Hum Factors
2 USAEEC, Ft Benjamin Harrison, ATTN: Library
1 USAPACDC, Ft Benjamin Harrison, ATTN: ATCP-HR
1 USA Comm-Elect Sch, Ft Monmouth, ATTN: ATSN-EA
1 USAEC, Ft Monmouth, ATTN: AMSEL-CT-HDP
1 USAEC, Ft Monmouth, ATTN: AMSEL-PA-P
1 USAEC, Ft Monmouth, ATTN: AMSEL-SI-CB
1 USAEC, Ft Monmouth, ATTN: C, Facl Dev Br
1 USA Materials Sys Anal Agcy, Aberdeen, ATTN: AMXSY-P
1 Edgewood Arsenal, Aberdeen, ATTN: SAREA-BL-H
1 USA Ord Ctr & Sch, Aberdeen, ATTN: ATSL-TEM-C
2 USA Hum Engr Lab, Aberdeen, ATTN: Library/Dir
1 USA Combat Arms Tng Bd, Ft Benning, ATTN: Ad Supervisor
1 USA Infantry Hum Rsch Unit, Ft Benning, ATTN: Chief
1 USA Infantry Bd, Ft Benning, ATTN: STEBC-TE-T
1 USASMA, Ft Bliss, ATTN: ATSS-LRC
1 USA Air Def Sch, Ft Bliss, ATTN: ATSA-CTD-ME
1 USA Air Def Sch, Ft Bliss, ATTN: Tech Lib
1 USA Air Def Bd, Ft Bliss, ATTN: FILES
1 USA Air Def Bd, Ft Bliss, ATTN: STEBD-PO
1 USA Cmd & General Stf College, Ft Leavenworth, ATTN: Lib
1 USA Cmd & General Stf College, Ft Leavenworth, ATTN: ATSW-SE-L
1 USA Cmd & General Stf College, Ft Leavenworth, ATTN: Ed Advisor
1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: DepCdr
1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: CCS
1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: ATCASA
1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: ATCACO-E
1 USA Combined Arms Cmbt Dev Act, Ft Leavenworth, ATTN: ATCACC-CI
1 USAECOM, Night Vision Lab, Ft Belvoir, ATTN: AMSEL-NV-SD
3 USA Computer Sys Cmd, Ft Belvoir, ATTN: Tech Library
1 USAMERDC, Ft Belvoir, ATTN: STSFB-DO
1 USA Eng Sch, Ft Belvoir, ATTN: Library
1 USA Topographic Lab, Ft Belvoir, ATTN: ETL-TD-S
1 USA Topographic Lab, Ft Belvoir, ATTN: STINFO Center
1 USA Topographic Lab, Ft Belvoir, ATTN: ETL-GSL
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: CTD-MS
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATS-CTD-MS
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-TE
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-TEX-GS
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-CTS-OR
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-CTD-DT
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-CTD-CS
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: DAS/SRD
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: ATSI-TEM
1 USA Intelligence Ctr & Sch, Ft Huachuca, ATTN: Library
1 CDR, HQ Ft Huachuca, ATTN: Tech Ref Div
2 CDR, USA Electronic Prvg Grd, ATTN: STEEP-MT-S
1 HQ, TCATA, ATTN: Tech Library
1 HQ, TCATA, ATTN: AT CAT-OP-Q, Ft Hood
1 USA Recruiting Cmd, Ft Sheridan, ATTN: USARCPM-P
1 Senior Army Adv., USAFAGOD/TAC, Elgin AF Aux Fld No. 9
1 HQ, USARPAC, DCSPER, APO SF 96558, ATTN: GPPE-SE
1 Stimson Lib, Academy of Health Sciences, Ft Sam Houston
1 Marine Corps Inst., ATTN: Dean-MCI
1 HQ, USMC, Commandant, ATTN: Code MTMT
1 HQ, USMC, Commandant, ATTN: Code MPI-20-2B
2 USCG Academy, New London, ATTN: Admission
2 USCG Academy, New London, ATTN: Library
1 USCG Training Ctr, NY, ATTN: CO
1 USCG Training Ctr, NY, ATTN: Educ Svc Ofc
1 USCG, Psychol Res Br, DC, ATTN: GP 1/62
1 HQ Mid-Range Br, MC Det, Quantico, ATTN: P&S Div

1 US Marine Corps Liaison Ofc, AMC, Alexandria, ATTN: AMCGS-F
1 USATRADOC, Ft Monroe, ATTN: ATRO-ED
6 USATRADOC, Ft Monroe, ATTN: ATPR-AD
1 USATRADOC, Ft Monroe, ATTN: ATTS-EA
1 USA Forces Cmd, Ft McPherson, ATTN: Library
2 USA Aviation Test Bd, Ft Rucker, ATTN: STEBG-PO
1 USA Agcy for Aviation Safety, Ft Rucker, ATTN: Library
1 USA Agcy for Aviation Safety, Ft Rucker, ATTN: Educ Advisor
1 USA Aviation Sch, Ft Rucker, ATTN: PO Drawer O
1 HOUSA Aviation Sys Cmd, St Louis, ATTN: AMSAV-ZDR
2 USA Aviation Sys Test Act., Edwards AFB, ATTN: SAVTE-T
1 USA Air Def Sch, Ft Bliss, ATTN: ATSA TEM
1 USA Air Mobility Rsch & Dev Lab, Moffett Fld, ATTN: SAVDL-AS
1 USA Aviation Sch, Res Trng Mgt, Ft Rucker, ATTN: ATST-T-RTM
1 USA Aviation Sch, CO, Ft Rucker, ATTN: ATST-D-A
1 HQ, DARCOM, Alexandria, ATTN: AMXCD-TL
1 HQ, DARCOM, Alexandria, ATTN: CDR
1 US Military Academy, West Point, ATTN: Serials Unit
1 US Military Academy, West Point, ATTN: Ofc of Milt Ldrshp
1 US Military Academy, West Point, ATTN: MAOR
1 USA Standardization Gp, UK, FPO NY, ATTN: MASE-GC
1 Ofc of Naval Rsch, Arlington, ATTN: Code 452
3 Ofc of Naval Rsch, Arlington, ATTN: Code 458
1 Ofc of Naval Rsch, Arlington, ATTN: Code 450
1 Ofc of Naval Rsch, Arlington, ATTN: Code 441
1 Naval Aerospc Med Res Lab, Pensacola, ATTN: Acous Sch Div
1 Naval Aerospc Med Res Lab, Pensacola, ATTN: Code L51
1 Naval Aerospc Med Res Lab, Pensacola, ATTN: Code L5
1 Chief of NavPers, ATTN: Pers-OR
1 NAVAIRSTA, Norfolk, ATTN: Safety Ctr
1 Nav Oceanographic, DC, ATTN: Code 6251, Charts & Tech
1 Center of Naval Anal, ATTN: Doc Ctr
1 NavAirSysCom, ATTN: AIR-5313C
1 Nav BuMed, ATTN: 713
1 NavHelicopterSubSqua 2, FPO SF 96601
1 AFHRL (FT) Williams AFB
1 AFHRL (TT) Lowry AFB
1 AFHRL (AS) WPAFB, OH
2 AFHRL (DOJZ) Brooks AFB
1 AFHRL (DOJN) Lackland AFB
1 HQUSAF (INYSD)
1 HQUSAF (DPXXA)
1 AFVTG (RD) Randolph AFB
3 AMRL (HE) WPAFB, OH
2 AF Inst of Tech, WPAFB, OH, ATTN: ENE/SL
1 ATC (XPTD) Randolph AFB
1 USAF AeroMed Lib, Bronks AFB (SUL-4), ATTN: DOC SEC
1 AFOSR (NL), Arlington
1 AF Log Cmd, McClellan AFB, ATTN: ALC/DPCRB
1 Air Force Academy, CO, ATTN: Dept of Bel Scn
5 NavPers & Dev Ctr, San Diego
2 Navy Med Neuropsychiatric Rsch Unit, San Diego
1 Nav Electronic Lab, San Diego, ATTN: Res Lab
1 Nav TrngCen, San Diego, ATTN: Code 9000-Lib
1 NavPostGraSch, Monterey, ATTN: Code 55As
1 NavPostGraSch, Monterey, ATTN: Code 2124
1 NavTrngEquipCtr, Orlando, ATTN: Tech Lib
1 US Dept of Labor, DC, ATTN: Manpower Admin
1 US Dept of Justice, DC, ATTN: Drug Enforce Admin
1 Nat Bur of Standards, DC, ATTN: Computer Info Section
1 Nat Clearing House for MH-Info, Rockville
1 Denver Federal Ctr, Lakewood, ATTN: BLM
12 Defense Documentation Center
4 Dir Psych, Army Hq, Russell Ofcs, Canberra
1 Scientific Advsr, Mil Bd, Army Hq, Russell Ofcs, Canberra
1 Mil and Air Attache, Austrian Embassy
1 Centre de Recherche Des Facteurs, Humaine de la Defense Nationale, Brussels
2 Canadian Joint Staff Washington
1 C/Air Staff, Royal Canadian AF, ATTN: Pers Std Anal Br
3 Chief, Canadian Def Rsch Staff, ATTN: C/CRDS(W)
4 British Def Staff, British Embassy, Washington
1 Def & Civil Inst of Enviro Medicine, Canada
1 AIR CRESS, Kensington, ATTN: Info Sys Br
1 Militaerpsykologisk Tjeneste, Copenhagen
1 Military Attache, French Embassy, ATTN: Doc Sec
1 Medecin Chef, C.E.R.P.A.-Arsenal, Toulon/Naval France
1 Prin Scientific Off, Appl Hum Engr Rsch Div, Ministry of Defense, New Delhi
1 Pers Rsch Ofc Library, AKA, Israel Defense Forces
1 Ministeris van Defensie, DOOP/KL Afd Sociaal Psychologische Zaken, The Hague, Netherlands